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**FACTORS OF COST IN PORK
PRODUCTION**

By F. W. PECK, Division of Agronomy and Farm Management

The data for this bulletin are taken from statistical route studies on six farms for ten years at Halstad, Norman County, and eight farms for five years at Cokato, Wright County. The inventory weights are estimates by the farmers and the representative of the Experiment Station. Weights of hogs sold are the weights at local stockyards or on the farm. Weights of hogs butchered for home consumption are actual weights in some cases and weights estimated by the farmer in others. No weights were available for the hogs that died during the period studied. By the term "gain of salable hogs" is meant the live weight of the hogs sold and those consumed on the farm.

FACTORS OF COST AT COKATO

Data for Eight Farms, Five Years, 1913-1917

Sows on record.....	285
Boars on record.....	19
Hogs purchased	94
Hogs sold and consumed.....	1,683
Pigs died (no record of weight).....	131
Gain of salable hogs, lbs.....	325,019

Method of Computing Net Weight of Salable Hogs

The total gain in weight of hogs produced includes the hogs sold for pork, those consumed at home, and the increase in weight, if any, as determined by comparing the two inventories. The following method was used to compute the net gain of salable hogs:

1. To the total opening inventory weight of hogs was added the weight of the hogs purchased during the period. This sum represents the "debit" weight.
2. To the closing inventory weight of hogs was added the weight of the hogs sold and those consumed in the household during this period. This sum represents the "credit" weight.
3. The total debit weight was subtracted from the total credit weight. The remainder is the net gain in weight of salable hogs. No record is available of the gain in weight of the pigs that died. Most of the deaths occurred at farrowing time.

Total Opening Inventory Weight:

287	sows	at 261 lbs.	74,900
17	boars	at 230 lbs.	3,975
399	pigs	at 110 lbs.	44,200
Total			123,075

Hogs Purchased:

94	head	at 76 lbs.	7,152
Total debit weight.			130,227

Total Closing Inventory Weight:

282	sows	at 260 lbs.	73,350
21	boars	at 231 lbs.	4,850
376	pigs	at 112 lbs.	42,200
Total			120,400

Hogs Sold and Consumed:

1,683	head	at 198 lbs.	334,846
Total credit weight.			455,246
Total debit weight.			130,227
Net gain in salable hogs.			325,019

Feed

The feed consumed by the hogs is divided into purchased feed and feed grown on the farm on which the hogs were fed. The figures quoted represent weighed feed with a definite monetary value. Accurate records of pasture consumed are not available in enough instances to allow tabulation, hence this factor is not included in the figures quoted. This was a comparatively small item on the farms studied, as no attempt was made to have special hog pasture. There is also a certain amount of farm and house refuse ordinarily consumed by hogs which has very little monetary value and for which records are not available.

Purchased Feeds:		Lbs.
Mill feeds		99,002
Corn		1,572
Total (5.5 per cent of total grain equivalent)		100,574

Farm-grown Feeds:

Grain*		1,501,545
Skim milk†	1,101,950	220,390
Potatoes†	3,050	610
Total (94.5 per cent of total grain equivalent)		1,722,545
Grand total grain equivalent.		1,823,119
Net gain of salable hogs.		325,019
Grain per cwt. of salable hogs.		561
Grain per pound of salable hogs.		5.61

* "Grain" includes all the grain consumed by the hogs that was grown on the farms studied. Various mixtures of these feeds make an accurate list of the exact amount of each feed in the ration impossible. From available data on this point it is estimated that the farm grains were fed in the proportion of corn 75 parts by weight, oats 15, and barley 10.

† Five pounds of skim milk and 5 pounds of potatoes are considered equivalent to 1 pound of grain.

Labor

An accurate record was kept of the man and horse hours required by the hog enterprise on the farms that coöperated in the investigation. This includes marketing, feeding, care, purchasing, and all labor chargeable to the hogs.

Total man hours.....	19,900
Man hours per hundred weight of salable hogs.....	6.1
Total horse hours.....	2,600
Horse hours per hundred weight of salable hogs.....	0.8

Cash Expense for Sundries

The cash expense on the hog enterprise includes such items as hog powders, veterinary fees, vaccine, medicine, hog rings, and registration of purebreds.

Total cash expense for sundries.....	\$175.19
Total cash expense per hundred weight of salable hogs.....	.05

General Expense

Each productive enterprise on the farm should bear its proportion of the general maintenance charge of the entire farm. This is called general expense and includes taxes, insurance, and man and horse labor spent on general upkeep. Hogs are charged with their share of the general expense labor on the basis of their direct labor requirements, and their share of the taxes and insurance is based on their capital value. The total general expense chargeable to the hog enterprise on the Cokato group of farms for the period 1913-1917 inclusive was \$417.15. This cost amounted to 13 cents per hundred weight of salable hogs produced.

Interest

Interest on the average investment in a productive farm enterprise is a legitimate factor of cost that should be included in the cost of production. With an enterprise such as hogs, however, in which the annual productive crop is marketed in less than a year, it is a difficult matter to determine the average investment for a definite period of time. In this study two steps are used to compute the total interest on the hog enterprise.

1. The interest is computed on the average weight of the opening and closing inventories. The average is determined by adding the two inventories and dividing the sum by two. Current prices of pork are assumed and interest is computed at 6 per cent.

2. The interest charge for the pork produced within the period is computed on one half of the net gain of salable hogs at the rate of 6 per cent for a period of eight months. This means in reality computing interest on the entire weight for four months as this would be the average time for the entire weight of the pork produced. This is 2 per cent on the total gain in weight.

To reduce the weight to an interest-bearing unit, pork is estimated at 15 cents a pound on the farm to fit conditions in May, 1918. Interest will naturally vary with the price of pork. For the Cokato group of farms the interest charge on the hogs would be as follows:

Opening inventory weight, lbs.	123,075
Closing inventory weight, lbs.	120,400
Average inventory weight, lbs.	121,738
121,738 lbs. at 15 cents per lb.	\$18,260.70
\$18,260.70 at 6 per cent interest.....	1,095.64
Total weight of salable hogs, lbs.	325,019

Assuming this weight is made during an eight-months period:

325,019 lbs. at 15 cents per lb.....	\$48,752.85
\$48,752.85 at 2 per cent (6 per cent for four months).....	975.06
Plus interest on average weight.....	1,095.64
Total interest charge.....	\$2,070.70
Interest charge per hundred weight of hogs, cents.....	63.7

FACTORS OF COST AT HALSTAD

Data on the hog enterprise for the Halstad group of farms are presented in similar manner as for the Cokato group.

Data for Six Farms at Halstad, Ten Years, 1908-1917

Sows on record.....	195
Boars on record.....	21
Pigs purchased	81
Hogs sold	1,485
Pigs died (no record of weight).....	298
Gain of salable hogs, lbs.	232,548

Method of Computing Net Weight of Salable Hogs

The same method was used to compute the net weight of salable hogs as is given for the Cokato group of farms.

Total Opening Inventory Weight:

191 sows at 246 lbs.....	47,950
20 boars at 243 lbs.....	4,875
344 hogs at 150 lbs.....	51,600
Total	103,520

Hogs Purchased:

81 head at 67 lbs.	5,444
Total debit weight.....	108,969

Total Closing Inventory Weight:

199 sows at 246 lbs.....	48,922
23 boars at 205 lbs.....	4,715
320 hogs at 150 lbs.....	48,000
Total	101,637

Hogs Sold and Consumed:

1,485 head at 161 lbs.	239,880
Total credit weight.....	341,517
Total debit weight.....	108,969
Total gain in salable hogs.....	232,548

Feed

Somewhat different grain rations are fed in the northwestern part of the state, owing to the replacement of corn with barley. The estimated proportion of farm-grown feeds in the grain ration for hogs on the Halstad group of farms is barley 50 parts by weight, corn 30, and oats 20.

Purchased Feeds:	Lbs.
Mill feeds	77,038
Tankage	1,200
Corn	2,939
Total (6.2 per cent of total grain equivalent)	81,177
Farm-grown Feeds:	
Grain	1,163,635
Skim milk*	354,882 70,976
Potatoes*	17,000 3,400
Total (93.8 per cent of total farm grain equivalent)	1,238,011
Grand total grain equivalent	1,319,188
Net gain of salable hogs	232,548
Grain per hundred weight of salable hogs	567
Grain per pound of salable hogs	5.67

* Five pounds of skim milk and 5 pounds of potatoes are considered equivalent to 1 pound of grain.

Labor

For the Halstad group of farms the labor requirements represent the same items of labor as given for the Cokato farms.

Total man hours	14,711
Man hours per hundred weight of salable hogs	6.3
Total horse hours	2,626
Horse hours per hundred weight of salable hogs	1.1

Cash Expense

Cash expense covers medicine, veterinary service, hog powders, and similar items.

Total cash expense	\$236.53
Cash expense per hundred weight of salable hogs11

General Expense

The same method of apportioning general expense on the hog enterprise was followed for the Halstad group of farms as for the Cokato group. On the Halstad group for the period 1908-1917, inclusive, the total general expense chargeable to the hog enterprise amounted to \$288.89. This amounts to 12 cents per hundred weight of salable hogs produced. It will be noted that the cost per hundred weight of salable pork is practically the same in both groups of hogs, there being less than one cent difference.

Interest

For the Halstad group of farms the interest charged on the hog enterprise is computed on the same basis as for the Cokato group. The statement appears as follows:

Opening inventory weight, lbs.	103,525
Closing inventory weight, lbs.	101,637
Average inventory weight, lbs.	102,581
102,581 lbs. at 15 cents per lb.	\$15,387.15
\$15,387.15 at 6 per cent interest	\$923.23
Total weight of salable hogs lbs.	232,548

Assuming this weight is made during an eight-months' period:	
232,548 lbs. at 15 cents per lb.	\$34,882.20
\$34,882.20 at 2 per cent (6 per cent for 4 months).....	697.64
Plus interest on average inventory weight.....	923.23
Total interest charge.....	\$1,620.87
Interest charge per hundred weight of hogs, cents.....	69.7

SUMMARY

Bringing the two groups of hogs together for the entire period covered shows a total gain of salable hogs of over half a million pounds. The feed required to produce a hundred weight of pork at Cokato was 561 pounds. For the Halstad group it amounted to 567 pounds, or an average of the two groups of 564 pounds.

The following figures illustrate the summary of the various factors of cost:

Summary of Cokato and Halstad Farms, 1908-1917

Sows on record.....	480
Boars on record.....	40
Hogs purchased	175
Hogs sold and consumed.....	3,168
Pigs died (no record of weight).....	429
Gain of salable hogs, lbs.	557,567
Grain and grain equivalent consumed, lbs.....	3,142,307
Grain and grain equivalent per cwt. of salable hogs, lbs.....	564
Grain and grain equivalent per lb. of salable hogs, lbs.....	5.64
Man hours required.....	34,611
Man hours required per cwt. of salable hogs.....	6.2
Horse hours required.....	5,226
Horse hours required per cwt. of salable hogs.....	0.9
Cash expense on hog enterprise.....	\$411.72
Cash expense per cwt. of salable hogs, cents.....	7.4
General expense on hog enterprise.....	\$706.04
General expense per cwt. of salable hogs, cents.....	12.6
Interest charge on hog enterprise.....	\$3,691.57
Interest charge per cwt. of salable hogs, cents.....	66

APPLICATION OF FACTORS OF COST IN ESTIMATING THE COST OF PRODUCING PORK

Factors Known in This Investigation:

1. Feed per hundred weight of salable hogs, lbs.....	564
2. Man hours per hundred weight of salable hogs.....	6.2
3. Horse hours per hundred weight of salable hogs.....	0.9
4. Cash expense per hundred weight of salable hogs, cents.....	7.4
5. General expense per hundred weight of salable hogs, cents.....	12.6
6. Interest charge per hundred weight of salable hogs, cents.....	66

Placing present-day values on known data:

1. Assuming all feed to be good quality marketable grain, it may be estimated at $2\frac{1}{2}$ cents per pound on the farm.
2. Man labor is estimated at 20 cents per hour.
3. Horse labor is estimated at 15 cents per hour.
4. If cash expense averaged 7.4 cents per hundred weight of pork from 1908-1917 it would be reasonable to increase this cost 50 per cent..

5. If general expense, which is largely "general labor," was valued at 12.6 cents per hundred weight in 1908-1917, this cost could reasonably be increased 50 per cent.

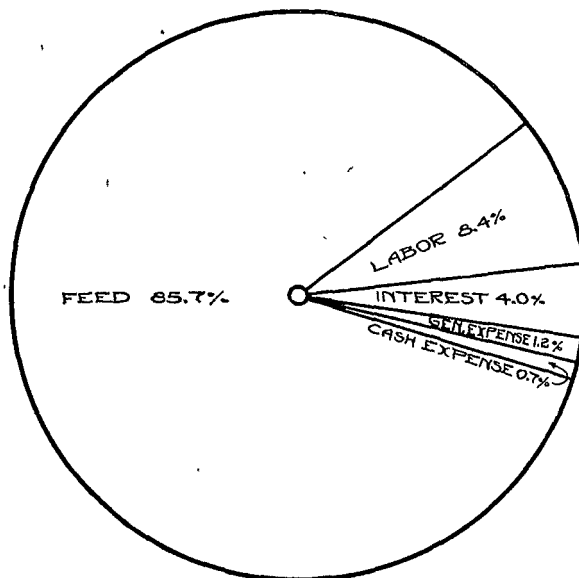
6. Interest has been computed on current prices.

On these bases the estimated cost of pork, on the farms studied, is shown in Table I.

TABLE I. ESTIMATED COST PER HUNDRED WEIGHT OF SALABLE HOGS

Item	Estimated cost	Percentage of total cost
Feed, 564 pounds at 2½ cents per pound.....	\$14.10	85.7
Labor, man hours, 6.2 at 20 cents..... \$1.24		
Labor, horse hours, 0.9 at 15 cents..... 0.14		
	1.38	8.4
Cash expense, 7.4 cents + (50 per cent of 7.4 cents).....	0.11	0.7
General expense 12.6 cents + (50 per cent of 12.6 cents)	0.19	1.2
Interest charge	0.66	4.0
Total cost per hundred weight*	\$16.44	100.0

* The only items of cost not included in this estimate are those for shelter and equipment. These would be small in terms of cost per hundred weight. From other investigations in Minnesota this charge for shelter and equipment has not exceeded 25 cents per hundred weight of gain.



Distribution of Cost in Pork Production

The cost per hundred weight of hogs is based on the assumption that only marketable feed was consumed. It is also assumed that this feed would net 2½ cents per pound on the farm, which as a matter of fact is probably more than could be ordinarily realized at present prices for the total amount of feed consumed by hogs. The rate of 2½ cents per pound is used to illustrate the maximum cost under present-day conditions. This maximum cost as illustrated amounts to \$16.44 per hundred weight of live hogs. This rate would be applicable only on farms where it was necessary to purchase at the above rate

all the feeds consumed. On the majority of farms 2 cents per pound or less would be more nearly a fair price to allow for the feed consumed by the hogs. This would lower the cost almost \$3 per hundred weight. During the last year, owing to the poor marketable condition of the corn crop, large numbers of hogs consumed feed that would probably be worth not more than 1½ cents per pound on the farm. Assuming that the other costs would approximate present conditions, this value of feed would make the total cost of live hogs \$10.80 per hundred weight of gain on the farm. This is probably nearer the actual cost on a great many farms than the figures given in Table I as the maximum cost.

Table II presents the cost per hundred weight of hogs for each group of farms for the period in which the records were obtained. With the average of the two groups for that period is compared the present-day estimated cost. Feed increased in farm value 108 per cent, using 2½ cents per pound as the present price. Labor increased 40 per cent on the average on these farms altho on many this increase is fully 100 per cent at the present time. The total increase in cost per hundred weight is 97 per cent. These figures assume that all the feed consumed was marketable at the prices used. It may be noted that the estimated cost per hundred weight for each of the groups, both for the period studied and under present-day prices, is slightly below the average market sale price for pork. It is doubtful if any other enterprise will exceed this margin of profit where all the costs are included.

This indicates that under good management the hog enterprise would pay a profit above a maximum market price for the feed, labor, interest, and other costs quoted.

TABLE II. ACTUAL COST PER HUNDRED WEIGHT OF PORK DURING 1908-1917 COMPARED WITH PRESENT-DAY COSTS*

Items	Cokato 1913- 1917	Halstad 1908- 1917	Average Cokato and Halstad	Present- day estimated cost	Per cent increase
Feed	\$7.28	\$6.23	\$6.76	\$14.10	108
Labor	1.00	0.99	0.99	1.38	40
Cash	0.05	0.11	0.07	0.11	50
General expense..	0.13	0.12	0.13	0.19	50
Interest	0.38	0.37	0.38	0.66	73
Total.....	\$8.84	\$7.82	\$8.33	\$16.44	97

* Feed was actually worth 1.3 cents per pound at Cokato over the 5-year period and 1.1 cents per pound at Halstad during the 10-year period, with an average of 1.2 cents. Two and one half cents per pound of feed is used for present-day cost. Labor rates were 15 cents per hour for man and 11 cents for horse labor at Cokato, and 14 cents for man and 10 cents for horse labor at Halstad. Twenty cents for man and 15 cents for horse labor are used for present costs. Pork is valued at \$9 per hundred weight for the Cokato group of farms for the 5-year average and \$8 per hundred weight for the Halstad group. Fifteen dollars per hundred weight is used to represent the current farm price of hogs.

MARKETING HOGS

The cost per hundred weight of hogs shipped through livestock shipping associations ranges from 30 to 35 cents, depending on the distance to market. In 1915, the Litchfield livestock shipping association handled 7,711 head weighing 1,590,415 pounds at a cost of 32.8 cents per hundred weight.¹ The distance to the central market was 80 miles. The margin usually demanded by local buyers ranged from 60 cents to \$1 per hundred weight, hence a considerable saving to the producers has resulted through the operation of the shipping associations.

¹ U. S. Dept. of Agr. Rept. No. 113, page 25.